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United States
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Forest Service

Tongass
National Forest

R10-MB-333

February 1997



Chasina Timber Sale

Draft Environmental Impact Statement

Summary



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Acronyms And Symbols

ADF&G	Alaska Department of Fish and Game
AHMU	Aquatic Habitat Management Unit
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ASQ	Allowable Sale Quantity
BBF	One Billion Board Feet
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFL	Commercial Forest Land
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act of 1976
DBH	Diameter at Breast Height
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EVC	Existing/Expected Visual Condition
FEIS	Final Environmental Impact Statement
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
IDT	Interdisciplinary Team
KPC	Ketchikan Pulp Company
KV	Knutsen-Vandenberg Act
LTF	Log Transfer Facility
LUD	Land Use Designation
LWD	Large Woody Debris (same as LOD)
MBF	One Thousand Board Feet
MELP	Multi-Entry Layout Process
MIS	Management Indicator Species
MM	Maximum Modification
MMBF	One Million Board Feet
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
P	Primitive
PR	Partial Retention
R	Retention
RM	Roaded Modified
RN	Roaded Natural
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
SHPO	State Historic Preservation Officer
SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Nonmotorized
TLMP	Tongass Land Management Plan
TRUCS	Tongass Resource Use Cooperative Survey
TTRA	Tongass Timber Reform Act
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
VCU	Value Comparison Unit
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

Acknowledgments

Front cover: By Cindy Ross Barber, 1992. The design illustrates the range of interconnected issues addressed in the EIS.



United States
Department of
Agriculture

Forest
Service

Alaska Region

Tongass National Forest
Ketchikan Area
Federal Building
Ketchikan, AK 99901

File Code: 1950

Date: FEB 28 1997

Dear Reader:

Enclosed is the Draft Environmental Impact Statement (EIS) for the Chasina Project Area.

If you received a complete set of documents, the following items should be found in the package:

1. Executive Summary
2. Draft Environmental Impact Statement (Volume I)
3. Draft EIS Appendices A - J (Volume II)
4. Large scale color Project Area Map of Existing Condition

Note that 11" x 17" maps of each alternative are included in Chapter 2 of the DEIS (Volume I).

If you elected to receive the summary only, you will find 11" x 17" alternative maps bound into the back of the document as well as a large-scale Project Area Map (Existing Condition Map) included with the summary.

You are encouraged to review and comment on the Draft EIS. Written comments must be received by April 25, 1997. Comments should be addressed to:

Forest Supervisor
Ketchikan Area
Tongass National Forest
Attn: Chasina EIS
Federal Building
Ketchikan, AK 99901

Subsistence hearings will be held in Saxman and Hydaburg. Each subsistence hearing will be preceded by an open house to answer questions you may have. The schedule of hearings and open houses is as follows:

Date	Open House Time	Subsistence Hearing Time	Community	Location
March 18	6-7:00 pm	7-9:00 pm	Hydaburg	ANB Hall
March 20	6-7:00 pm	7-9:00 pm	Saxman	City Hall

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I encourage you to take the time to review and comment on the Draft EIS, as well as to participate in the subsistence and public hearings. Your input will be used to prepare the Final EIS and the Record of Decision. Your interest in the management of the Tongass National Forest is appreciated.

Sincerely,



BRADLEY E. POWELL
Forest Supervisor

Enclosures



Draft Environmental Impact Statement

Chasina Timber Sale

**United States Department of Agriculture
Forest Service-Alaska Region
Alaska**

Lead Agency: U.S.D.A. Forest Service
Tongass National Forest
Ketchikan Administrative Area

Responsible Official: Forest Supervisor
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Abstract

The USDA Forest Service proposes to harvest approximately 50 million board feet (MMBF) of timber in the Chasina Project Area, Craig Ranger District, Ketchikan Administrative Area, Tongass National Forest. Timber volume would be offered through the Ketchikan Area timber sale program. The actions analyzed in this EIS are designed to implement direction contained in the Tongass Land Management Plan (TLMP, 1979a, as amended) and the Tongass Timber Reform Act. The EIS describes six alternatives which provide different combinations of resource outputs and spatial locations of harvest units. The alternatives include: 1) No Action, proposing no new harvest from the Project Area at this time; 2) configure harvest units to emphasize wildlife habitat and maintain the integrity of large unfragmented blocks of old-growth forest; 3) configure harvest units to emphasize a positive net economic return, while seeking to strike a balance between competing resource uses; 4) optimize the amount of timber offered while keeping the amount of new road construction to a minimum; 5) configure harvest units to emphasize timber sale economics and conventional cable yarding methods; and 6) configure harvest units to provide the maximum amount of timber within Forest Plan Standards and Guidelines.

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Summary

Key Terms

Alternative—one of several policies, plans, or projects proposed for decision making.

Allowable Sale Quantity (ASQ)—the maximum quantity of timber that may be sold each decade from a National Forest.

Best Management Practices (BMPs)—practices used for the protection of water quality.

Land Use Designation (LUD)—method of classifying land uses allocated by the Forest Plan.

MMBF —million board feet

Management Area —an area for which management direction was written in the Forest Plan (TLMP 1979a, as amended 1986) management areas encompass one or more Value Comparison Units (VCUs).

Old-growth Forest —an ecosystem distinguished by old trees and related structural attributes. Old-growth forests encompass the latter stages of stand development. They typically differ from earlier stages of stand development in a variety of characteristics which may include tree size, accumulation of large dead woody material, number of canopy layers and tree species composition, and ecosystem function.

Scoping Process —activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate

Subsistence—the customary and traditional uses by rural Alaskan residents of wild renewable resources for direct personal or family consumption and for customary trade.

Tongass Land Management Plan (TLMP)—the 10-year land allocation plan for the Tongass National Forest, also known as the Forest Plan. The TLMP was completed in 1979 and was amended in 1986 and again in 1991 (TLMP 1979a, as amended). The TLMP is currently undergoing revision; the Draft Environmental Impact Statement (DEIS) for the Proposed Revised Forest Plan was issued in 1990; a supplement to the TLMP Revision DEIS was issued in 1991 (TLMP Revision Supplement DEIS 1991a); and a Revised Supplement to the TLMP Revision Supplement DEIS was issued in 1996 (Revised Supplement Draft TLMP EIS 1996a). Reference in the Chasina EIS to the Revised Supplement Draft TLMP EIS (TLMP RSDEIS, 1996a) is to the DEIS as proposed to be implemented in the Preferred Alternative of the Revised Supplement, unless otherwise noted. Until the Forest Plan Revision is completed, the TLMP (1979a, as amended) remains in effect.

Value Comparison Unit (VCU)—areas which generally encompass a drainage basin to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

Introduction

In compliance with the National Environmental Policy Act (NEPA) and other relevant State and Federal laws and regulations, the Forest Service has prepared this Environmental Impact Statement (EIS) on the effects of timber harvest in the Chasina Project Area (Figure SUM-1) on Prince of Wales Island of the Ketchikan Administrative Area, Tongass National Forest. The proposed action would make up to approximately 50 million board feet (MMBF) of timber available to the Ketchikan Area timber sale program. The EIS discloses the direct, indirect, and cumulative environmental impacts and any irreversible or irretrievable commitment of resources that would result from each proposed alternative.

Public Participation in the Decision-making Process

Public involvement in the process began formally on October 27, 1995 with the mailing of a scoping package to individuals, government agencies, Native corporations, and interested organizations describing the proposed action and inviting public comment on the scope of the issues and areas of major concern to be addressed by the environmental analysis.

Announcements about the project were printed in the Island News, Ketchikan Daily News, Sitka Sentinel, Juneau Empire, Petersburg Pilot, and Wrangell Sentinel. A scoping document describing the project was placed in the October 27, 1995 edition of the Ketchikan Daily News. A Notice of Intent (NOI) to prepare an EIS was published in the Federal Register on November 2, 1995. Individual consultations were held with state and federal agencies.

Subsistence hearings on the Draft EIS will be held in Saxman and Hydaburg. Open Houses will be held in conjunction with the subsistence hearings to discuss the analysis process and answer public questions on the Draft EIS. Public comment on the Draft EIS will also be accepted at that time. Comments will be recorded and transcribed.

Release of the Draft EIS triggers a minimum 45-day public comment period. The period for public comment on this Draft EIS and the deadline for receipt of written comments are noted in the cover letter accompanying this document and will be publicized in the local media. Written comments on the EIS can be mailed to:

Forest Supervisor
ATTN: Chasina EIS
Tongass National Forest
Federal Building
Ketchikan, AK 99901

Decision to be Made

Based on the information contained in this EIS, the Forest Supervisor will decide to (1) select one of the alternatives presented in the Final EIS (FEIS), (2) modify an alternative as long as the environmental consequences of the modified action have been analyzed within the FEIS, or (3) reject all alternatives and request further analysis. If an alternative is selected, it will be documented in the Record of Decision (ROD).

Project Area

The 68,927 acre Chasina Project Area is located approximately 25 air miles southwest of Ketchikan, Alaska (Figure SUM-1). It encompasses an area south of Cholmondeley Sound on Prince of Wales Island extending from South Arm east all the way out to Chasina Point. There are no communities within or adjacent to the project area. Access to the project area is by small plane or boat generally originating in Ketchikan.

The project area includes Tongass Land Management Plan (TLMP 1979a, as amended) Management Area K18, Polk Inlet, Management Area K24, South Arm/Lancaster Cove, and Management Area K25, North Arm Moira (Figure SUM-2). The Polk Inlet Management Area includes value comparison unit (VCU) 674. The South Arm/Lancaster Cove Management Area includes VCUs 677, 678, 679, 680, and 681. The North Arm Moira Management Area includes VCU 682. VCU boundaries generally follow major watershed divides with a few minor exceptions.

Figure SUM-1
Project Vicinity Map

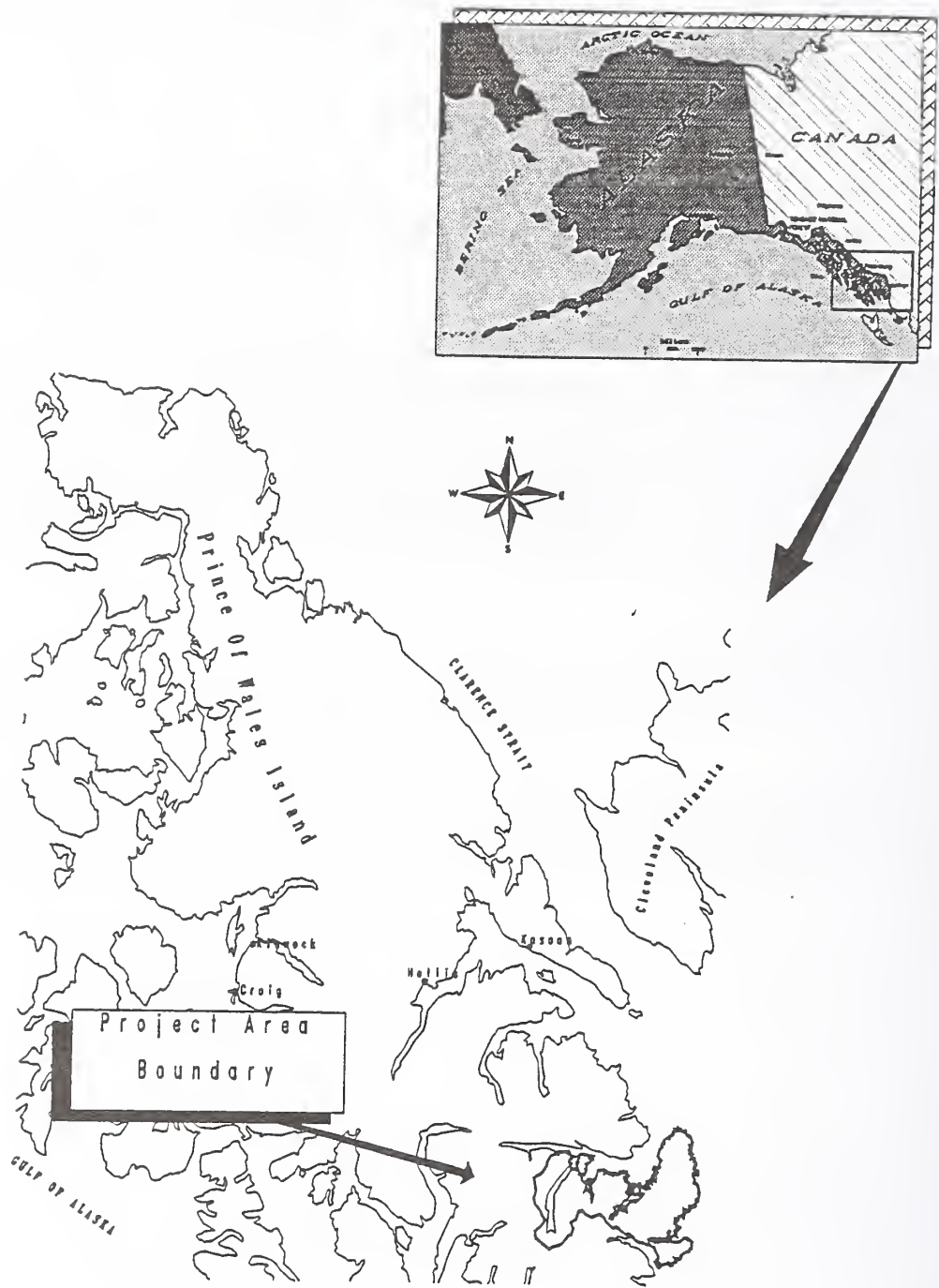
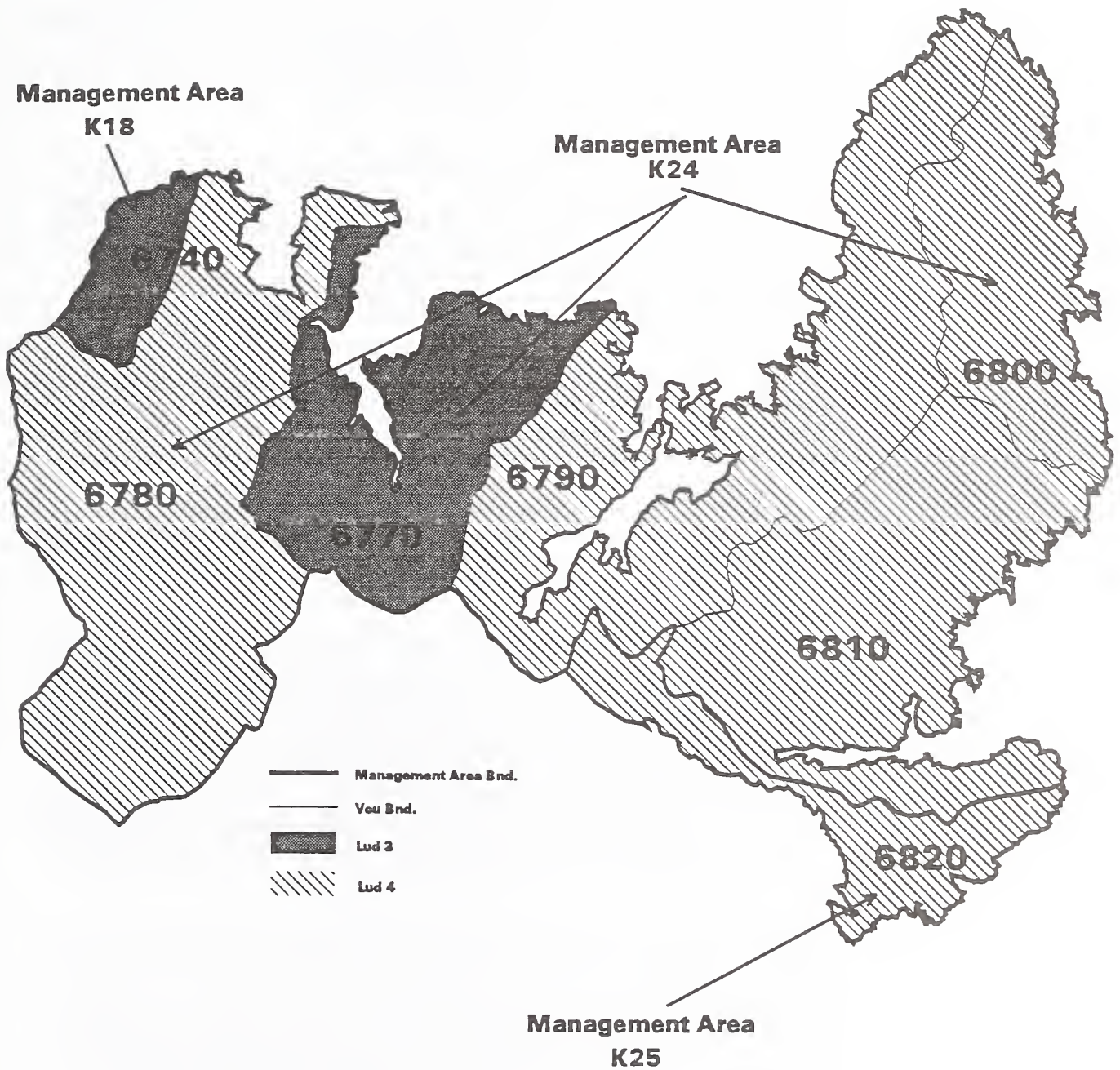


Figure SUM-2
Management Area and VCU Boundaries



Purpose and Need

The purpose and need for this project is to implement direction contained in the Tongass Land Management Plan (TLMP 1979a, as amended), to help provide a sustained level of timber supply to meet annual and TLMP planning cycle market demand, and to provide local employment in the woods products industry, consistent with providing for the multiple use and sustained yield of all renewable forest resources. The alternatives and actions considered are possible approaches to meeting this purpose and need. The EIS study process was designed to help insure that, in meeting this purpose and need, the Forest Service makes the most informed decision possible for this project area specifically, and for the Tongass National Forest generally. The Chasina Project is expected to provide up to approximately 50 MMBF of timber, given the guidance of the Forest Plan.

Implement TLMP

Under TLMP, the project area has been given Land Use Designation (LUD) IV, with an exception for the two harvest units in VCU 674, which are LUD III. The TLMP schedules timber sale preparation for all Management Areas in the project area. A comparison of the Desired Future Condition for the project area, as reflected in TLMP direction, with the existing condition shows the need to convert suitable stands of old growth to managed productive stands capable of long-term timber production.

TLMP Revision

Alternatives developed for the Chasina Project took into account the LUDs and standards and guidelines that were being analyzed for the Preferred Alternative (Alternative 3) for the TLMP RSDEIS (1996a). This includes 500 foot beach buffers, 1,000 foot estuary buffers, blocks of Old-growth Habitat Reserves in the vicinity of South Arm Cholmondeley Sound and the area between Kitkun Bay and North Arm Moira Sound, areas managed for Modified Landscape (VCUs 674 and 682), and the current land status (some land has been recently conveyed to Kootznook Native Corporation). The rest of the project area is to be managed for timber production.

Timber Demand

Section 101 of the Tongass Timber Reform Act of 1990 (TTRA), directs the USDA Forest Service "... to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle." Section 101 of the TTRA specifies that Forest Service efforts to seek to meet market demand are subject to appropriations, National Forest Management Act (NFMA) requirements, and other applicable laws. Providing a timber supply from the Tongass for sustained local wood products industry employment and related economic and social benefits is an objective of the TLMP and the Alaska National Interest Land Conservation Act (ANILCA), as amended by the TTRA.

There is demonstrated mill capacity in the region to process logs, if a supply of timber is available. There is also a projected need for the timber volume being considered from this project area for the Forest Service to come closer to meeting an objective of providing a three-year supply of timber under contract to the existing dependent industry (see Appendix A), as a means of providing for stability in relation to fluctuating market demand (Morse, 1995). There is a substantial component of the economy of Southeast Alaska that is dependent on a viable timber industry. Based on these factors, the need for the project is clearly indicated.

Reasons for Scheduling the Environmental Analysis of the Chasina Project Area

Reasons for scheduling the Chasina Project Area at this time, for detailed consideration of timber harvest under the Ketchikan Area timber sale program, may be summarized as follows:

- The Chasina Project Area contains a sufficient amount of harvestable timber volume designated as LUD III or IV, and therefore appropriate for harvest under the Tongass Land Management Plan (TLMP). Available information indicates harvest of the amount of timber being considered for this project can occur consistent with TLMP Standards and Guidelines and other requirements for resource protection. Analysis also indicates harvest of the amount of timber being considered can occur consistent with the proposed TLMP Standards and Guidelines and other resource protection requirements.
- Areas with available timber both within and outside the designated sale area will also be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).
- Effects on subsistence resources are projected to differ little according to which sequence these areas are subjected to harvest. Harvesting other areas on the Tongass National Forest with available timber is expected to have similar potential effects on resources, including those used for subsistence because of widespread distribution of subsistence use and other factors. Harvest of these other areas is foreseeable, in any case, over the forest planning horizon under either the existing or proposed revised TLMP.
- Providing substantially less timber volume than required to meet TLMP and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the Chasina Project Area or other project areas would not meet contract requirements and is otherwise not necessary or reasonable.
- It is reasonable to schedule harvest in the Chasina Project Area at the present time rather than other areas in terms of previous harvest entry and access, level of controversy over subsistence and other effects, and the ability to complete the National Environmental Policy Act (NEPA) process and make timber available. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EISs that are currently ongoing or scheduled to begin soon.

Additional information about why the Chasina area was selected is provided in Appendix A of the Chasina Draft EIS.

Issues

Issues Associated with the Proposed Action

The significant public issues, management concerns, and resource opportunities identified through the public and internal scoping process were used to formulate issues statements. Some of these issues were raised by the public, and some reflect Forest Service concerns. Similar issues and concerns were grouped when appropriate.

Issues 1 through 8 were determined to be significant and within the scope of the project. All these issues will be addressed in all alternatives. Issues A-E were considered but eliminated from detailed study because their resolution falls outside the scope of the Chasina project.

Issue 1: Timber Economics and Supply

The issue encompasses public concern with the amount of timber available and proposed for harvest, methods of timber harvest, whether timber harvest should be continued, and balancing timber production with other Forest uses. It includes the issue of how the project area contributes to the long-term timber supply. It also includes concern for ensuring cost-effective timber harvest.

Issue 2: Fish Habitat and Water Quality

This issue addresses public concern for maintaining water quality in streams which provide suitable habitat for anadromous and resident fish. Fish and shellfish within the Chasina Project Area are important to sport, commercial, and subsistence users throughout Southeast Alaska.

Issue 3: Recreation and Scenic Quality

Forest management activities could affect existing recreational pursuits for users of the Chasina Project Area. More specifically, increased human access, timber harvest, and other developments could affect recreation values and opportunities including: hunting, fishing, scenic quality, and existing recreation facilities. Comments mentioned the importance of protecting the scenic quality along inlets and bays. Other aspects of this issue were related to conflicting uses in North Arm Moira.

Issue 4: Wildlife

This issue includes concerns over several wildlife species and the habitats critical to the maintenance of those wildlife populations; Alaskan wildlife is valuable for aesthetic, economic, recreational, ecological, and subsistence purposes. Of primary concern are the effects of timber harvest and associated road construction upon wildlife species dependent on old-growth habitat. There is also a concern regarding the proportion of Volume Classes 6 and 7 remaining after harvest in each management area. The long-term disposition of previously mapped old-growth areas (commonly referred to as retention areas) in the project area was identified as part of this issue. Related to the overall concern is the question of whether timber harvest operations would further fragment existing large blocks of old-growth habitat and result in declines in biological diversity. The need for a project specific old-growth habitat strategy that ties into a larger scale habitat strategy was also identified.

Issue 5: Subsistence

Primary concern is the potential effect, as well as the cumulative effects, of timber harvest and road construction upon the abundance and distribution of subsistence resources. For many, subsistence consists of hunting, fishing, trapping, and gathering to supplement their food sources, income, and other needs. For Southeast Alaska's Natives, it is a way of life

directly related to preserving their culture and traditions. The Alaska National Interest Lands Conservation Act (ANILCA) specifically requires the Forest Service to determine if the proposed activities may significantly restrict subsistence use. Other aspects to be evaluated are competition from non-rural subsistence users and access to the resources.

Issue 6: Caves and Karst

This issue reflects concerns about how the cave and karst resources in the project area will be managed and protected.

Issue 7: Social and Economic Effects

This issue reflects concerns about effects on community employment and income, population, community stability, and lifestyles. The economies of most communities in Southeast Alaska depend almost exclusively on the Tongass National Forest to provide natural resources for uses such as fishing, tourism, recreation, timber harvesting, mining, and subsistence. Many Southeast Alaskans want to maintain the natural environment which makes their lifestyle unique. At the same time, they want to continue maintaining their economic livelihood.

Issue 8: Marine Environment

The marine waters and their associated mud flats and estuaries found in protected coves and bays within the project area provide habitat for species such as Dungeness crab and juvenile salmon. Since coves and bays are the points of concentrated activity associated with marine transport of logs, logging camps, and sort yards, some marine species are subject to effects from log transfer and storage facilities. Three potential or existing LTF sites are under consideration in the alternatives.

Issues Outside the Scope of This Analysis

The following public issues were considered but eliminated from detailed study because their resolution is beyond the scope of this document.

Issue A: Land Use Designations/Forest Plan Revision

This issue focuses on the stated desire of some commenters to change TLMP Land Use Designations to eliminate, reduce, or increase the level of harvest and/or maximize specific resources.

Land use allocation is a Forest planning issue. The current Forest Plan is under revision and provides a forum for people who wish to see the area managed in a manner that differs from the current direction.

Issue B: Development Outside the Project Area

Comments regarding the general level of development outside the project area are not considered issues ripe for decision under the Chasina EIS. These areas include other National Forest land on Prince of Wales Island, and Native lands. However, timber harvest that has occurred on Native lands will be included in the Cumulative Effects Analysis for the various resources.

Issue C: Below Cost Timber Sales

Below cost timber sales are a national issue and not within the scope of this project. The financial impacts of the alternatives, based on a mid-market analysis, are displayed in Chapter 3 in this EIS.

Issue D: Timber Supply and Demand

Timber supply and demand is a regional issue and exceeds the scope of this analysis. A site-specific environmental analysis documents the effects of the proposed activities; it does not constitute the selling or conveyance of property rights. The volume of timber cleared in any NEPA document may be offered (sold) in part, in whole, or not at all.

The timber offered for sale (timber offerings) may occur in one year or be spread over a three- to five-year period. Therefore, trying to predict the effects of the proposed activities upon the regional timber supply or demand is beyond the capability and scope of this document beyond concluding that timber offerings that implement the project will contribute volume to the timber supply and help meet demand.

The issue of how the project area contributes to the long-term timber supply is addressed as part of Issue 1: Timber Economics and Supply.

Issue E: Manage Chasina for Sustained Yield

The National Forest Management Act (NFMA) directs that a sustainable level of harvest be identified for each National Forest. A sustainable level of harvest is one in which the level of harvest is equal to or less than the rate of growth over a period of time (ten years in the case of NFMA). There is no direction or intent to establish a sustainable level of harvest for individual project areas or small geographic subdivisions of the Forest.

Alternative Development

Each action alternative presented in this EIS is a different response to the significant issues discussed in Chapter 1. For this EIS, five action alternatives were developed to meet the stated purpose and need of the project, while minimizing or avoiding environmental impacts. Each action alternative represents a site-specific proposal developed through intensive interdisciplinary unit and road design using high resolution topographic maps, GIS mapping capabilities, and aerial photos coupled with resource inventories and site inspections.

The alternative formulation process has been guided by several concepts and principals of sound resource management. Each alternative follows the standards, guidelines, and direction contained in the TLMP, the Alaska Regional Guide, and applicable Forest Service manuals and handbooks. Because of the possibility that the timber volume may be used to satisfy part of the contractual requirements of a long-term timber sale contract, they are also designed to meet the requirements of the Tongass Timber Reform Act (TTRA).

Ecosystem Management

Ecosystem management is a concept incorporated into forest management in recent years. The philosophy is to emphasize ecological, physical, and social sciences to guide resource management to sustain the health, productivity, and intangible values of the land. These concepts were considered in the selection and design of individual harvest units and roads included in the alternatives.

Ecosystem management looks at forest management on two levels: (1) the landscape level, which may be a geological province (geoprovince) or a large watershed; and (2) the stand level, which deals with individual harvest units. The forest plan incorporates ecosystem management at the **landscape level** through land use allocation and the development of standards and guidelines. This separates incompatible uses and spreads impacts out over time

and space. Many issues—such as maintaining large unfragmented blocks of old growth over time and maintaining the connectivity between those blocks—can only be resolved over the entire rotation through the land use allocation or forest planning process. A site-specific project level plan evaluates the assumptions made in a higher level plan. It then implements that direction and responds to public comments through the development of alternatives which determine which stands are treated and how they are managed.

Some tools employed at the **stand level** may include:

- a deferred entry
- reducing harsh edges through unit placement, looking for opportunities to retain small patches of uncut timber in harvest units (where feasible and practical)
- maintaining existing travel corridors
- leaving snags in harvest units (where safety regulations allow)
- trying nonstandard harvest practices where resource issues and physical limitations permit.

The Chasina IDT utilized a combination of public scoping issues and resource knowledge to subdivide the Chasina Project Area into a variety of important landscape zones. Definition of these landscape zones considered such aspects as the amount, distribution, and fragmentation of old-growth forests; the level and distribution of previous timber harvest and roading; travel and dispersal corridors between zones that can be used by animals; the existing and potential road network for accessing timber; subsistence uses; visually sensitive areas; and important recreation areas. The landscape zones also considered the recommendations of the Viable Population (VPOP) Committee on such aspects as small, medium, and large Habitat Conservation Areas (HCAs). The landscape level considerations included the characteristics of the Chasina Project Area itself as well as its relationship to adjacent areas such as the harvest activities on Kootznoowoo, Inc. lands, the Polk Inlet Project Area, and wildlife habitat outside the project area. Consideration was given to social factors (including subsistence use, visual concerns, timber harvest economics, and proposed land use designations) in the development of landscape zones. Table SUM-1 displays the Landscape Management Zones identified by the interdisciplinary team for the Chasina Project Area.

Summary

Table SUM-1
Chasina Landscape Management Zones

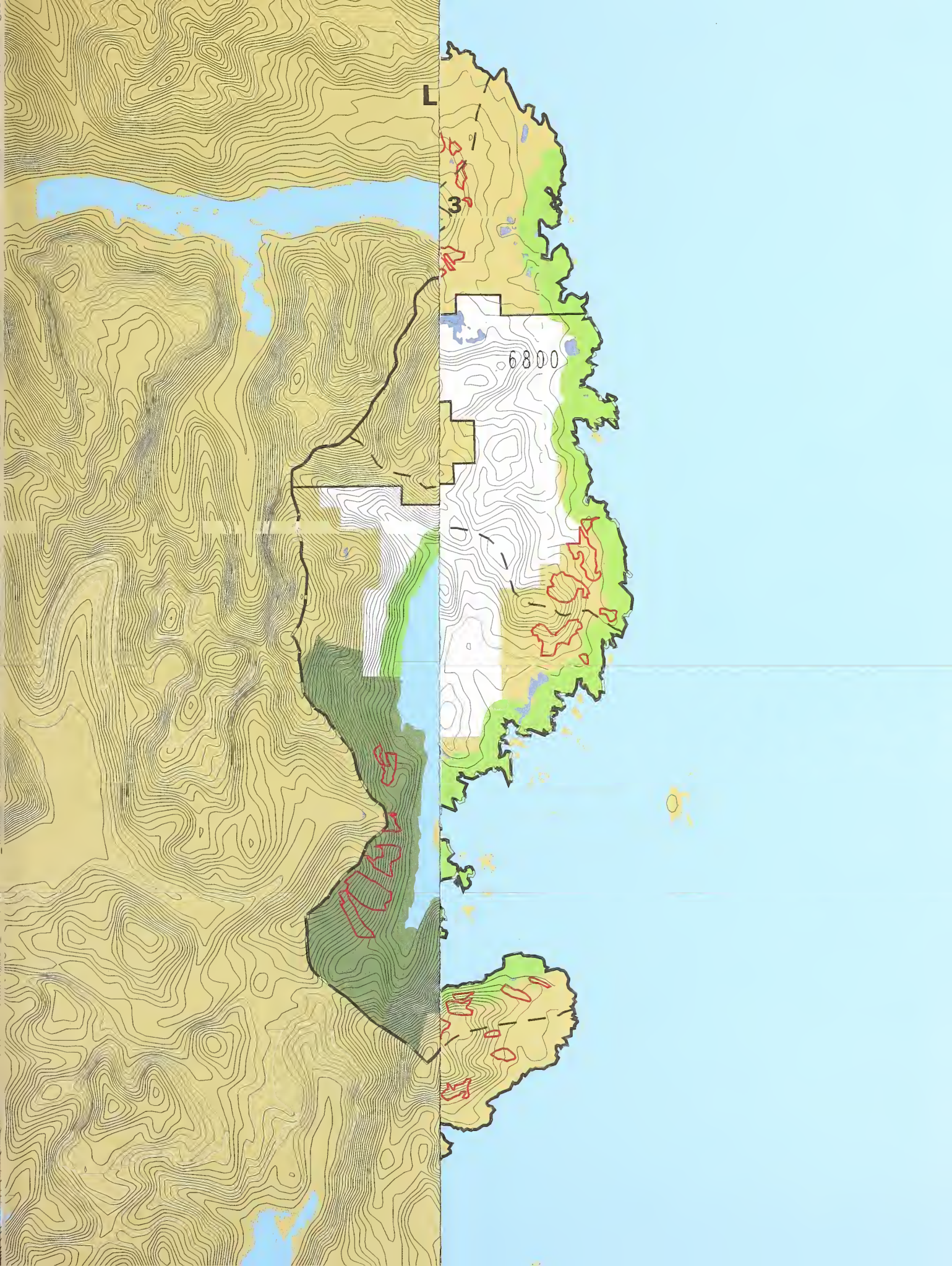
Landscape Zones	Description
1. Large and Medium sized old-growth habitat blocks	Large and medium Habitat Conservation Areas (HCAs) as defined in the 1994 Draft Interim Habitat Management Guidelines EA. No final decision has been issued. The shape and configuration displayed represents one potential way of providing core areas of unfragmented old-growth habitat where significant populations of old-growth dependent species can be maintained.
1(A) Nutkwa Block	This large old-growth habitat block is comprised of the Nutkwa LUD II Area (timber harvest is not allowed) plus a portion of VCU 678 that connects to the estuary at the head of South Arm of Cholmondeley Sound. This block is approximately 38,300 acres in size and also contains the old-growth patches at the head of South Arm which are available for harvest under TLMP RSDEIS (1996a).
1(B) Kitkun Bay Block	This medium sized old-growth habitat block is located around Kitkun Bay or Salt Chuck. This block is approximately 10,400 acres in size. This block extends down to Port Johnson and North Arm Moira. This area contains the largest of unfragmented, high volume old-growth forest in the project area. When combined with the fact that it surrounds a salt chuck, this block is very important for wildlife habitat.
2. Late-successional Corridors	Corridors approximately one-quarter mile wide that provide connectivity between core areas of unfragmented old-growth habitat. These corridors generally follow riparian zones or other areas of gentle topographic relief commonly utilized for migration between areas.
3. Low and Very Low Economic Zones	<p>These zones represent areas which are only economical to harvest during market cycles with very high stumpage when lumped together with more profitable offerings which could help average out costs, or if augmentation (contributed funds) helps to offset costs.</p> <p>Dora Bay Area VCU 677 - National Forest System lands in this area have become isolated and scattered as a result of land conveyances to Kootznoowoo, Inc. Estimated road costs to connect this area to existing roads on Kootznoowoo lands or to the Lancaster LTF are cost-prohibitive. Virtually all of the timber within this zone has been classified as unsuitable for timber harvest due to very high mass movement potential (MMI 4) soils, and what is not has small, isolated units with low volume per acre. Therefore, there is insufficient timber value to recover the road construction costs.</p> <p>Chasina Point Area VCU 679/680 - This area is characterized by relatively flat terrain with extensive areas of noncommercial forest. Much of the commercial forest land consists of narrow strips of low-volume old growth that is frequently located in stream buffers, making them unavailable for timber harvest. Due to the small amount of timber available, a large portion of the timber which is available would be harvested the first entry. The timber economics of the area are poor due to the low volume available per mile of road constructed. Since most of the timber in this area is Volume Class 4 and 5, harvesting units in this area could help alternatives meet proportionality. Several dispersed recreation sites are located in the area. Field crews did observe high wildlife use of the area.</p> <p>East Dolomi Area VCU 680/681 - This area is along Clarence Strait and is surrounded by lands owned and managed by Kootznoowoo, Inc. Most of the lands surrounding this area have been harvested within the last 10 years. This harvest decreased the effectiveness of the beach fringe as a</p>

Table SUM-1 (continued)
Chasina Landscape Management Zones

Landscape Zones	Description
	travel corridor for wildlife. The commercial lands in this area are mostly low volume, but are economically more feasible than the Chasina Point area. The Forest Service has retained an easement across Kootznoowoo, Inc. land to access this from the Lancaster area. Like Chasina Point, timber harvest in this area could help alternatives meet proportionality.
4. Lancaster VCU 679	This area includes the existing LTF and developed road system. Timber harvest in this zone is very profitable due to the concentration of high-volume, old-growth forest and the limited amount of road construction needed to access the timber. Part of the reason for the concentration of high volume old growth is that part of the area is underlaid with limestone which results in the development of well-drained, productive forests. Cave and karst features exist and current mitigation measures have been applied. The portion of this area adjacent to saltwater has been identified as an important wildlife corridor. Several dispersed recreation sites exist in the area, with hunting and trapping activities apparent. Field crews did observe high wildlife use in this area, especially by bear and wolf.
5. Port Johnson VCUs 681/682	This entire peninsula is currently in an undeveloped condition. Much of the coastal areas are steep with cliffs. The North Arm Moira shoreline has several good anchorages. The area contains a variety of dispersed, undeveloped recreation sites. It is also heavily used by the commercial fisheries fleet. A large percentage of the peninsula is noncommercial forest land, and most of the commercial forest land is low volume. The area between Port Johnson and Kitkun Bay is designated as a medium-sized HCA. A road constructed through the HCA to Port Johnson will have poor economics due to the low amount of timber accessed per mile of road construction. The land just north of the peninsula has been harvested and has an existing LTF on Kootznoowoo, Inc. land. It may be possible to conduct some helicopter logging on the north side of the peninsula while maintaining the visual, recreational, and wildlife values that exist on the south side along North Arm Moira. An LTF has been proposed in North Arm Moira, which is an option versus making a road connection to the Lancaster LTF. Another option is to helicopter harvest units in the area.
6. Cannery Creek VCUs 674/678	<p>The Cannery Creek zone is another block of unfragmented, high volume, old-growth forest. This old-growth block is adjacent to a small HCA that was part of "Old-growth Retention Strategy A" for the Polk Inlet FEIS and is included in the small HCA as part of the "Old-growth Retention Strategy B". This is an important location for wildlife habitat due to the impacts that are occurring on other lands immediately adjacent to this area. To the east and south, old-growth forests on private lands are being or have been harvested. To the west, additional native harvesting is occurring in the Big Creek and Sulzer Portage areas. In order to harvest wood from the Cannery Creek, a new LTF and approximately 7 miles of road would need to be constructed; or all the timber would need to be helicoptered to a barge or "boom bags". The timber economics of this area are lower than roaded areas like Lancaster.</p> <p>Bands of karst features have been found between Cannery Creek and South Arm Cholmondeley Sound.</p>


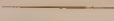








Chapter 3 and the Appendices contain additional maps that present some of the features described above in greater detail. The landscape zones described in the previous table (Table SUM-1) are displayed by location in Figure SUM-3.

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Landscape Zones - Chasina Project



	Private & State Lands		Contours
	Lands outside Large Medium or Small Old Growth blocks		Unit Pool
	Large and Medium Old growth Reserves		VCU Lines
	Travel Corridors		Project Boundary
	Seawater		Economic Zones

0 1 41 2 82 Miles

Mapscale 1:89274

Alternatives Eliminated from Detailed Study

A number of alternatives were examined, but not considered, for detailed study in this draft environmental impact statement (DEIS). This section presents those alternatives and the rationale for not considering them further.

Alternative A

Single Resource or Issue

Alternatives that focused upon one resource or issue were eliminated from consideration as implementable alternatives. While alternatives constructed around a single resource may not be implementable, the issue itself may still be significant. Each alternative will be evaluated against all the significant issues.

Alternative B

Avoid Previously Mapped Old-growth Retention Areas

Several commenters asked the Forest Service to analyze an alternative that would keep intact all previously mapped old-growth retention during this entry. Under the 1996 TLMP RSDEIS Standards and Guidelines, old-growth habitat will remain unaltered in beach, estuary, and TTRA buffers, research natural areas, LUD I and LUD II areas, as well as in unsuitable commercial forest land. Previously mapped old-growth retention areas are consequently considered as part of the tentatively suitable and available timber base, unless otherwise excluded. Approximately 801 acres of retention were established as part of previous project level EISs, but no documents could be found which map these areas.

Current conservation biology theory places greater emphasis on larger blocks of old growth which have logical connections for wildlife movement. This alternative was, therefore, not considered in detail.

Alternative C

Manage the Chasina Project Area for Sustained Yield/Even Flow of Forest Products

Several commenters asked the Forest Service to display an alternative that displayed the real sustainable harvest level when taking into consideration such things as "falldown" and rotation lengths based on site index, not a 100-year rotation age. Although this alternative has not been displayed, the components of this issue are analyzed in the Silviculture and Timber and Socio-Economic sections of Chapter 3 as cumulative impacts.

Alternative D

Several public and agency comments requested the Forest Service analyze a reduced harvest within the Chasina Project Area, or select the no-action alternative because of the extensive timber harvest that has occurred on other ownership within the project area. Because of the defined purpose and need of the project (provide wood to the Ketchikan Area timber sale program), the current range of alternatives is being analyzed. More information on why lower volumes were not considered is included in Appendix A of the Chasina Draft EIS.

Alternatives Considered for Detailed Study

Six alternatives for making timber available to local timber purchasers from the Chasina Project Area were considered in detail. Each alternative is consistent with the TLMP (1979a, as amended) and the Preferred Alternative of the TLMP RSDEIS (1996a). For each alternative this section provides a discussion of: (1) the emphasis or intent of the alternative, (2) various resource outputs associated with implementation, and (3) environmental consequences. Alternatives are compared in detail later in this chapter and summarized in Table SUM-2.

Summary

Alternative 1 (No Action)

Emphasis

The emphasis of this alternative is to propose no new timber harvest from the Chasina Project Area at this time. It does not preclude timber harvest from other areas at this time, or from the Chasina Project Area at some time in the future. The Council of Environmental Quality (CEQ) regulations 40 CFR 1502.14d requires a “No-Action” alternative be analyzed in every EIS. This alternative serves as a benchmark by which effects of the other action alternatives are to be measured. The Existing Condition map shows the distribution of vegetation associated with no new timber harvest.

Outputs

There are no new timber harvest outputs associated with this alternative. Visual quality, wildlife habitat quality, recreation opportunities, as well as other resource values would remain at their current condition.

Alternative 2

Emphasis

The emphasis of this alternative is to meet the stated purpose and need while avoiding timber harvest in VCUs 674, 677, 678, and the Kitkun Bay area. These areas contain the largest blocks of high value wildlife habitat in the project area and deferral would avoid any fragmentation of them this entry. Individual unit selection attempted to avoid wildlife travel corridors. This alternative differs from Alternative 3 in that less volume is harvested and units were selected for harvest as to avoid areas identified during scoping as being important or special.

Outputs

Alternative 2 schedules the harvest of 33 individual harvest units, totaling 34.1 MMBF of sawlog plus utility volume from 1,160 acres, indicating an average unit size of 35.2 acres. Of this harvest, 521 acres are planned for partial cut treatments; the remainder are planned for clearcut harvest. This alternative requires the construction of 12 miles of new specified roads plus 8 miles of reconstruction. Road construction clearing will yield an additional 2.8 MMBF of right-of-way (ROW) volume. This indicates an average of 2.8 MMBF per mile of new road construction. It schedules 129 acres or 9.8 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-23.45 per MBF.

No new log transfer facilities (LTFs) would be required to implement this alternative. Floating or land based logging camps are anticipated with the Lancaster LTFs.

Alternative 3

Emphasis

The emphasis of this alternative is to meet the stated purpose while striking a balance between timber sale economics and other resource values. This alternative makes an entry into VCU 678, but leaves the Cannery Creek watershed intact. A road tie from Port Johnson Peninsula to the proposed LTF in North Arm Moira would occur under this alternative. Timber harvest would not occur in large old-growth blocks designated as HCAs in South Arm or the Kitkun Bay Area and would maintain the small HCA proposed in the Polk Inlet FEIS for Strategies A and B.

Outputs

Alternative 3 schedules the harvest of 56 individual harvest units, totaling 55 MMBF of sawlog plus utility volume from 1,900 acres, indicating an average unit size of 33.9 acres. Of this harvest, 345 acres are planned for partial cut treatments; the remainder are planned for clearcut harvest. This alternative requires the construction of 37 miles of new specified roads plus 11 miles of reconstruction. Road construction clearing will yield an additional 6 MMBF of right-of-way (ROW) volume. This indicates an average of 1.6 MMBF per mile of new road

construction. It schedules 179 acres or 4.0 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-53.90 per MBF.

The development of two new LTFs and the use of one existing LTF will be required to implement this alternative. Floating or land based logging camps are anticipated with the proposed North Arm Moira and West Arm Cholmondeley LTFs, and the existing Lancaster Cove LTF. The Alternative 3 map provides the spatial relationship among roads, units, and other geographic features of the Chasina Project Area.

Alternative 4

Emphasis

The emphasis of this alternative is to harvest the maximum amount of timber while keeping the amount of road construction to a minimum. This alternative looks at helicopter logging several portions of the project area and utilizing barge or small water drop areas (Cannery Creek and Port Johnson Peninsula) instead of constructing logging roads and LTFs. This alternative will display the trade-offs in economics and resource concerns between helicopter logging and conventional cable logging/road building.

Outputs

Implementation of this alternative would schedule the harvest of 2,891 acres in 74 harvest units for approximately 85 MMBF of sawlog and utility volume, indicating an average unit size of 39 acres. Of this harvest, 598 acres are planned for partial cut treatments; the remainder are planned for clearcut harvest. To implement this level of harvest, 19 miles of new road would be constructed, and 12 miles of existing road would require reconstruction. Road construction clearing will yield an additional 2 MMBF of right-of-way (ROW) volume. This indicates an average of 4.5 MMBF per mile of new road construction. It schedules 1,290 acres or 35.2 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-25.05 per MBF.

No new LTFs would be required to implement this alternative. Floating or land-based logging camps are anticipated with the Lancaster Cove LTF.

Alternative 5

Emphasis

The objective of this alternative is to emphasize timber economics and conventional cable yarding methods. The location of harvest units, selection of silvicultural prescriptions, logging systems, and a transportation network is primarily based on maximizing the mid-market value. This entry proposes only limited helicopter timber harvest. This approach emphasizes a positive net economic return for the proposed harvest units, by avoiding the low and very low economic zones to the extent possible to meet proportionality.

Outputs

Alternative 5 schedules the harvest of 64 individual harvest units, totaling 64.0 MMBF of sawlog and utility volume from 2,261 acres, indicating an average unit size of 35.3 acres. Of this harvest, 317 acres are planned for partial cut; the remainder are planned for clearcut harvest. This alternative requires the construction of 33 miles of new specified roads plus 12 miles of reconstruction. Road construction clearing will yield an additional 5 MMBF of right-of-way (ROW) volume. This indicates an average of 1.9 MMBF per mile of new road construction. It schedules 458 acres or 10.7 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-37.08 per MBF.

The development of one new LTF and the use of one existing LTF will be required to implement this alternative. Floating or land based logging camps are anticipated with the West Arm Cholmondeley and Lancaster Cove LTFs. The Alternative 5 map provides the

Summary

spatial relationship among roads, units, and other geographic features of the Chasina Project Area.

Alternative 6

Emphasis

The emphasis of this alternative is to accelerate progress toward the desired future condition for timber management while meeting Forest Plan Standards and Guidelines for other resources. Timber volume made available to local timber purchasers is maximized this entry under this alternative. This alternative is designed to evaluate the effects of harvesting as much of the project area as possible in a combination that still meets standards and guidelines. This alternative serves as an upper level benchmark that can be used to project the cumulative affects of the reasonably foreseeable future activities (see Appendix A) within the project area. Another feature of this alternative is that it looks at the maximum amount of road that could be constructed.

Outputs

Implementation of this alternative would schedule the harvest of 4,225 acres, in 124 harvest units for approximately 120 MMBF of sawlog and utility volume, indicating an average unit size of 34 acres. Of this harvest, 530 acres are planned for partial cut treatment; the remainder are planned for clearcut harvest. To implement this level of harvest, 63 miles of new road would be constructed, and 12 miles of existing road would require reconstruction. Road construction clearing will yield an additional 8 MMBF of right-of-way (ROW) volume. This indicates an average of 1.9 MMBF per mile of new road construction. It schedules 907 acres or 23.4 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-50.08 per MBF.

The development of one new LTF and the use of one existing LTF will be required to implement this alternative. Floating or land based logging camps are anticipated with the West Arm Cholmondeley and Lancaster Cove LTFs. The Alternative 6 map provides the spatial relationship among roads, units, and other geographic features of the Chasina Project Area.

Forest Service Preferred Alternative

Using an evaluative process that compares the benefits and adverse effects of each alternative against the issues, the USDA Forest Service has identified Alternative 3 as the Preferred Alternative for this EIS. The identified Preferred Alternative will be examined before preparation of a Final EIS, taking into consideration public comments received, as well as additional information and analysis.

Comparison of Alternatives

The comparison of alternatives draws together the conclusions from the analysis presented throughout the document and provides a summary of the results. Table SUM-2 provides a summary of activities, outputs, and environmental consequences by which the alternatives may be compared. The following sections provide a comparison of alternatives by: (1) summary comparison of outputs and environmental consequences, (2) proposed activity, and (3) significant issues.

Summary Comparison

Table SUM-2 provides a summary of activities, outputs, and environmental consequences by which the alternatives may be compared.

Table SUM-2
Summary Comparison of Alternatives

Activity/Resource	Units	Alternatives					
		1	2	3	4	5	6
Timber							
Units	Number	0	33	56	74	64	124
Estimated harvest unit volume	MMBF	0	34	55	85	64	120
Estimated right-of-way (ROW) volume	MMBF	0	1	6	2	5	8
Uneven-aged partial cuts (diameter limits, group selections)	Acres	0	527	345	598	317	530
Clearcut harvest	Acres	0	633	1,555	2,293	1,944	3,695
Total harvest	Acres	0	1,160	1,900	2,891	2,261	4,225
Units over 100 acres	Number	0	1	1	2	0	2
Shovel harvest	MMBF	0	0	.8	0	0	.8
Running Skyline	MMBF	0	21.6	39.8	39.9	44.1	74.2
Live Skyline (Shotgun)	MMBF	0	1.2	4.3	5.3	5.3	9.8
Slackline harvest	MMBF	0	1.5	6.1	4.0	3.0	10.7
Helicopter harvest	MMBF	0	9.8	4.0	35.2	10.7	23.7
Estimated stumpage (mid-market rates)	\$ / MBF	0	-23.45	-53.95	-25.05	-37.08	-50.08
Estimated stumpage (current rates)	\$ / MBF	0	+154.31	+123.86	+152.34	+140.68	+127.00
Receipts to State of Alaska	\$M	0	566	1,879	1,179	1,588	3,001
Average annual jobs over 4 years	# of jobs	0	51	86	124	98	183
Roads and Transportation							
Specified road construction	Miles	0	12	37.2	19.4	33.1	63.1
Road reconstruction	Miles	0	7.7	10.7	11.6	11.6	11.6
Temporary road construction	Miles	0	2.4	6.5	4.5	6.2	12.1
New log transfer facilities (LTFs)	Each	0	0	2	0	1	1
Reconstruction/Use of existing LTFs	Each	0	1	1	1	1	1
Roads crossing Class I or II streams	Number	0	12	35	10	24	43
Biodiversity							
Unfragmented old-growth patches remaining							
1,000 acres and larger	Acres	14,215	13,647	13,114	8,698	9,925	8,516
500-1,000 acres	Acres	4,019	2,871	2,834	5,091	5,844	3,858
100-500 acres	Acres	3,548	3,929	3,442	4,672	3,198	4,759
Nutkwa old-growth habitat - large block	Acres Harvested	0	0	0	146	146	252
Kitkun Bay old-growth habitat - medium block	Acres Harvested	0	0	0	704	574	856
Corridors connecting old-growth blocks	Affected	N/A	No	Yes	Yes	Yes	Yes
Productive old-growth acres remaining in project area	Acres	24,178	23,018	22,278	21,287	21,917	19,953
Percent of existing old growth remaining	Percent	100	95	92	88	91	83
Wildlife - Project Area							
1998 MIS - deer	Habitat Capability	2,017	1,924	1,879	1,807	1,843	1,713
1998 MIS - bear	Habitat Capability	77	75	73	71	72	69
1998 MIS - marten	Habitat Capability	86	82	80	77	79	73
1998 MIS - river otter	Habitat Capability	52	52	52	52	52	51
1998 MIS - hairy woodpecker	Habitat Capability	890	855	841	800	818	763
1998 MIS - Vancouver Canada goose	Habitat Capability	222	216	210	204	208	197
1998 MIS - bald eagle	Habitat Capability	121	121	121	121	121	120
1998 MIS - brown creeper	Habitat Capability	1,947	1,876	1,855	1,754	1,782	1,675
1998 MIS - gray wolf	Habitat Capability	5.8	5.5	5.4	5.2	5.3	4.9

Summary

Table SUM-2 (continued)
Summary Comparison of Alternatives

Activity/Resource	Units	Alternatives					
		1	2	3	4	5	6
Subsistence - WAAs 1210, 1211, and 1213							
High and Moderate use subsistence (TRUCS)	Acres Harvested	0	0	0	0	0	0
Deer habitat capability	Habitat Capability	5,984	5,891	5,846	5,774	5,810	5,680
Deer population needed to support current harvest	Habitat Capability	800	800	800	800	800	800
Significant Possibility of a Significant Restriction							
Deer	Response	No	No	No	No	No	No
Bear	Response	No	No	No	No	No	No
Furbearers	Response	Yes	Yes	Yes	Yes	Yes	Yes
Salmon	Response	No	No	No	No	No	No
Other Finfish	Response	No	No	No	No	No	No
Waterfowl	Response	No	No	No	No	No	No
Marine Mammals	Response	No	No	No	No	No	No
Indirect and cumulative effects of implementing the Forest Plan over the entire rotation	Response	May	May	May	May	May	May
Cultural Resources							
Impacts to known cultural resources	Each	0	0	0	0	0	0
Floodplains and Wetlands							
Proposed harvest on floodplain soils	Acres	0	16	17	3	7	27
Proposed roading on floodplain soils	Acres	0	0	0	0	0	0
Proposed harvest on vegetated wetlands	Acres	0	324	796	760	865	1278
Proposed roading on vegetated wetlands	Acres	0	69	231	88	205	334
Soils							
Proposed harvest on very high MMI soils	Acres	0	5	32	39	3	56
Proposed roading on very high MMI soils	Acres	0	0	4	1	2	5
Proposed harvest on high MMI soils	Acres	0	179	418	789	716	1261
Proposed roading on high MMI soils	Acres	0	21	92	60	115	181
Proposed harvest on moderate MMI soils	Acres	0	366	756	1123	724	1522
Proposed roading on moderate MMI soils	Acres	0	73	201	160	173	343
Proposed harvest on low MMI soils	Acres	0	480	556	456	446	827
Proposed roading on low MMI soils	Acres	0	93	123	101	125	183
Projected soil disturbance by harvest	Acres	0	104	173	233	182	333
Projected soil disturbance by roads	Acres	0	117	362	230	338	650
Harvest on High Karst Vulnerability	Acres	0	0	0	0	0	0
Harvest on Medium Karst Vulnerability	Acres	0	101	158	400	198	413
Visual Quality							
Meets or Exceeds Proposed Visual Quality Objectives							
West Arm Cholmondeley Sound	Response	Exceeds	Exceeds	Exceeds	Meets	Meets	Meets
Sunny Cove	Response	Exceeds	Exceeds	Meets	Meets	Meets	Meets
Lancaster Cove	Response	Exceeds	Exceeds	Meets	Meets	Meets	Meets
Kitkun Bay	Response	Exceeds	Exceeds	Exceeds	Meets	Meets	Meets
Port Johnson	Response	Exceeds	Meets	Meets	Meets	Exceeds	Meets
Moria Sound	Response	Exceeds	Exceeds	Meets	Meets	Meets	Meets
North Arm	Response	Exceeds	Exceeds	Exceeds	Meets	Exceeds	Meets
Recreation							
Change in ROS class from P & SPNM to RM	Percent	0	4	30	35	34	61
Roadless areas	Acres	36,290	30,905	20,920	19,554	23,857	13,157
Recreation sites with change in ROS	Number	0	1	9	2	6	8

Comparison of Alternatives by Proposed Activity

The action alternatives propose the harvest of from 33 to 124 individual units. Alternative 6 proposes the highest level of harvest with approximately 4,225 acres of timber harvest. Of the action alternatives, Alternative 2 proposes the lowest level of harvest with 1,160 acres. Table SUM-3 shows the number of acres proposed for harvest by each alternative by silvicultural system.

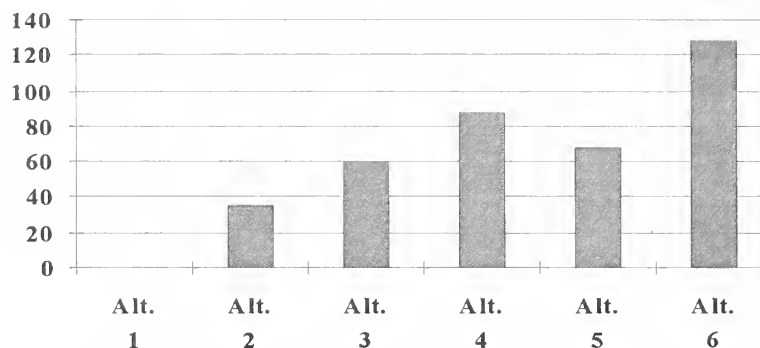
Table SUM-3
Total Acres Proposed for Harvest by Silvicultural System

Silvicultural System	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Partial Cut	0	527	345	598	317	530
Clearcut	0	633	1,555	2,293	1,944	3,695
Total	0	1,160	1,900	2,891	2,261	4,225

Uneven-aged management (partial cuts) planned in the alternatives ranges from 317 acres in Alternative 5 to 598 acres in Alternative 4.

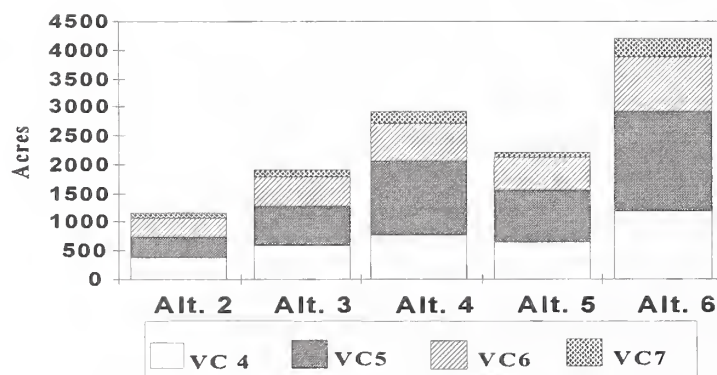
Excluding right-of-way (ROW) volume each action alternative, except Alternative 2, generated more volume than the identified purpose and need of 40 MMBF. Figure SUM-4 shows the volume of timber proposed for harvest by each alternative.

Figure SUM-4
Total Volume Proposed for Harvest Including ROW volume, in MMBF



Commercial forest land (CFL) is divided into Volume Class Strata according to the Ketchikan Area's timber type map. This volume class information is used in calculating volume harvested and economic analysis. Figure SUM-5 shows volume class strata breakdown for each alternative. Inclusions of stands typed as non-commercial forest that were field verified to be merchantable were aggregated into the Volume Class 4 acres.

Figure SUM-5
Proposed Harvest by Volume Class Strata



Road development is divided into two main categories—construction and reconstruction. Table SUM-4 shows the number of miles of new road construction and reconstruction proposed to access the harvest units for each alternative.

Table SUM-4
Proposed New Road Construction & Reconstruction (in Miles)

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
New Road Construction	0	12.0	37.2	19.4	33.1	63.1
Road Construction	0	7.7	10.7	11.6	11.6	11.6

There is one existing LTF and two new LTFs required to implement the various alternatives. Alternative 3 would utilize all three LTFs (Lancaster Cove, West Arm Cholmondeley, and North Arm Moira). This analysis has roughly estimated which units or groups of harvest units would most economically be hauled to a given LTF. Actual haul may be different. Table SUM-5 shows the volume of harvest projected to be hauled to each LTF.

Table SUM-5
Proposed Harvest, by Existing & New Log Transfer Facility, in MMBF

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Lancaster Cove	0	34.1	31.5	64.5	55.3	108.8
North Arm Moira*	0	0	11.6	0	0	0
West Arm Cholmondeley*	0	0	10.7	0	10.7	10.7

SOURCE: USDA Forest Service

* New Log Transfer Facilities

Comparison of Alternatives by Significant Issue

Chapter 1 presents in detail the significant issues that are the focus of this EIS and the key indicators for evaluating the impacts of timber harvest on each issue. This section compares the alternatives in terms of these issues. The baseline for comparing alternatives is Alternative 1, the no-action alternative. Chapter 3 contains the detailed evaluation of the potential effects of timber harvest and road construction activities under each alternative on forest resources.

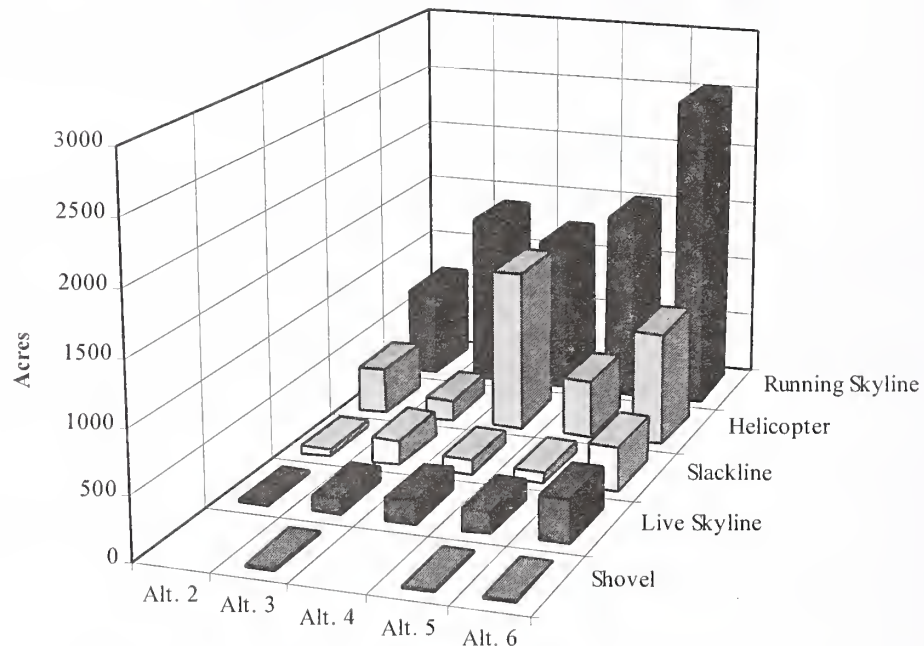
Summary

Issue 1. Timber Harvest Economics

Logging Systems

Estimated timber economics focuses on the residual value (stumpage) of the timber after all associated logging and transportation costs are subtracted. Generally, the most expensive logging method is helicopter, followed by slackline, highlead, live skyline (shotgun), running skyline, and shovel yarding. Average yarding distance, uphill versus downhill yarding, volume per acre, species composition and value, in combination with other factors, will influence the relative cost of each yarding method. Helicopter yarding is necessary in areas where it is impractical to build road or where aerial logging is necessary to meet specific standards and guidelines. Alternative 4 proposes the most helicopter volume (35 MMBF), while Alternative 3 proposes very little (4 MMBF). Figure SUM-6 compares the logging systems proposed for each alternative.

Figure SUM-6
Timber Harvest by Logging System



Mid-market Value

The analysis of timber values in the Timber section of Chapter 3 looked at both the mid-market and current-market values for each alternative. The current-market values are considerably higher than the average or mid-market values which indicate that: (1) consumer demand is higher, (2) timber supplies are limited, or (3) some combination of the above is true.

All of the alternatives show a positive net stumpage at current-market values, while none of the alternatives are positive at mid-market value.

Table SUM-6 compares the economics of timber harvest in dollars/thousand board feet (\$/MBF) for each alternative under mid-market conditions (generally representing the average market condition and product mix) and current-market conditions. The conversion rate expresses the net dollar value of the timber volume after subtracting the production costs from the log values.

Table SUM-6
Estimated Mid-market and Current-market Stumpage Value

Components	Alternatives					
	1	2	3	4	5	6
Mid-market						
Conversion Rate (\$/MBF)	0	\$-23.45	\$-53.90	\$-25.00	\$-37.08	\$-50.08
Current-market						
Conversion Rate (\$/MBF)	0	+\$154.31	+\$123.86	+\$152.34	+\$140.68	+\$127.00

SOURCE: USDA Forest Service

Issue 2. Fish Habitat and Water Quality

Best Management Practices

There is no measurable effect on water quality or fisheries production by any of the timber harvest or associated activities proposed by any of the action alternatives. All alternatives meet the requirements and intent of the Clean Water Act. Implementation of the TTRAs requirement to provide a minimum 100-foot buffer on Class I streams and Class II streams flowing directly into Class I streams would effectively mitigate direct stream channel impacts from proposed timber harvest and road construction. Adherence to BMPs outlined in the Soil and Water Conservation Handbook (USDA FSH 2509.22) during the design of units and roads will minimize the potential direct effects to fish as well. Site-specific BMPs were developed and selected to minimize the potential for impact to fish habitat. These site-specific BMPs are noted on the individual Harvest Unit and Road Design cards in Appendix J.

Habitat Capability

Fish habitat capability models are used to estimate the effects of timber harvest on the capability of streams to provide habitat for selected species of salmon and trout. Because there are many factors which influence fish populations—including commercial/sport harvest, oceanic conditions, and predation—these computer models provide only relative measures of habitat capability. These models indicate that there is no change in habitat capabilities for coho and pink salmon, or for Dolly Varden char and the species which they represent, among the alternatives including the no-action alternative.

TLMP RSDEIS 1996a, Preferred Alternative

The majority of watersheds (VCUs) within the project area have experienced prior roading and road construction. Reentering these drainages may generate a greater potential risk for impacts on water quality, with the risk expected to be greater in those watersheds with the higher cumulative percents of harvest. The standards and guidelines associated with Alternative P of the TLMP Draft Revision (1991a) limit the amount of timber harvest within a

given watershed to 35 percent of the total land base within a 15-year period, although this has been dropped from the current TLMP RSDEIS (1996a). Table SUM-7 shows the existing direct and indirect effects of timber harvest on third-order watersheds and important second-order watersheds.

Table SUM-7
Cumulative Watershed Effects, Percentage of Watershed Harvested in Third Order or Larger Watersheds and Important Second-order Watersheds

Watershed Number	% Watershed Harvested 1982-1997					
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Third Order Watersheds						
E92A	26	26	26	28	26	32
E94A	58	70	70	58	64	70
H06A	0	0	0	0	0	0
H21A	0	0	<1	1	7	8
H27A*	61	61	61	61	61	63
H28A	8	8	8	8	8	9
H30A*	0	0	0	3	3	3
H38A*	48	48	48	48	48	48
H54A*	53	54	54	54	54	54
H62A	13	26	29	33	29	33
H63A	39	48	48	56	48	56
Second Order Watersheds						
H05A	1	1	1	2	2	2
H49A	1	1	1	13	4	18
H50A	15	15	15	18	18	18
H59A	8	25	15	24	21	26

SOURCE: USDA Forest Service 1996

* Includes Kootznoowoo, Inc. lands that have been harvested since 1982.

Stream Crossings

Another measure of potential risk to fish habitat from timber harvest is the associated new road construction and road reconstruction which crosses streamcourses (see Chapter 3-Aquatic Resources). During placement of culverts or bridges, sediment may be introduced into the streams which may have short- or long-term effects on water quality. Alternative 2 proposes the fewest stream crossings, while Alternative 6 proposes the most. This is shown in Table SUM-8.

Table SUM-8
Stream Crossings to be Constructed

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Class I	0	10	17	5	12	24
Class II	0	2	18	5	12	19
Class III	0	19	72	36	74	108
Total Crossing	0	27	107	46	98	151

SOURCE: USDA Forest Service 1996

Mass Movement Index (MMI)

Following timber harvest, there is an increased risk of landslides until second growth and the brush layer become firmly established. One way of analyzing this risk is to determine the amount of timber harvest on slopes which have high mass movement index (MMI) soils. This rating does not imply that such a mass-wasting event will occur; rather, it ranks the alternatives on the basis of the potential for a mass-wasting event to occur, which may or may not result in an increase in stream sediment. This increased stream sedimentation may result in some loss or impairment of resident and anadromous fish spawning and rearing habitat. Table SUM-9 displays the proposed harvest on high MMI (MMI = 3) and very high MMI (MMI = 4) soils by alternative. Virtually all very high MMI soils have been removed from the base. Only those sites that appear to be small inclusions or mistyped have been retained in the unit pool. These sites have been examined by a soil scientist as part of unit reconnaissance.

Table SUM-9
Acres of High Hazard Soils Harvested by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
High MMI Soils	0	179	418	789	716	1261
Very High MMI Soils*	0	5	32	39	3	56

SOURCE: USDA Forest Service

* See Chapter 3-Soils for details of MMI classifications.

Summary

Sediment Transfer and Deposition

Three separate watersheds were evaluated for sediment delivery and depositional potential using a watershed-level analysis (Geier and Loggy, 1995). Sediment transport and deposition indices were developed based upon watershed morphology, discharge, and potential sediment sources. This sediment transfer index indicates where in a watershed sediment production and deposition is a potential problem for maintenance of aquatic habitat. The quantity of sediment transported and deposited depends upon a number of factors, including the nature of the sediment source, stream discharge, and channel morphology. These are factors that resource managers must consider when they undertake activities on areas that are linked to important aquatic habitat.

Results of this sediment transport and deposition risk assessment for roads and units indicate that alternatives that include Units 679-507, 679-425, and 679-422 have the highest potential for sediment delivery to streams. By avoiding harvest units and road construction near streamcourses in high risk sub-basins, Alternative 2 presents the lowest overall risk of sediment production and delivery to sensitive stream reaches. Alternative 6 presents a higher risk of producing sediment that may affect beneficial uses, mainly by proposing road construction and timber harvest in watersheds already heavily harvested. Alternative 6 poses the highest risk of sediment delivery.

Issue 3. Recreation and Scenic Quality

Scenic Quality

There are 3 key viewsheds within the project area. The proposed visual quality objectives (VQOs) for this project establish the minimum visual quality management standards for these key viewsheds.

Table SUM-10 displays the proposed VQOs for each key viewshed and the percent change in visual cumulative disturbance level by alternative. Alternative 1 represents the existing visual condition. In all viewsheds for all alternatives, the proposed harvest units achieve the proposed visual quality objectives.

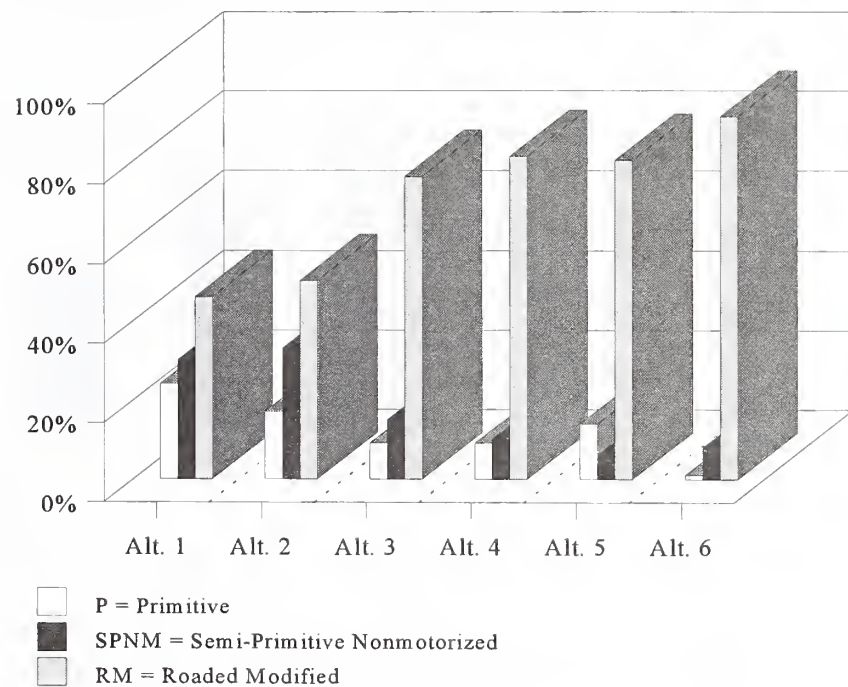
Table SUM-10
Proposed VQOs and Changes in Cumulative Visual Disturbance

	Proposed VQO	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
W. Arm Chol. Sound	Par. Ret./Mod.	Exceeds	Exceeds	Exceeds	Meets*	Meets*	Meets*
Sunny Cove	Par. Ret./Mod./ Max. Mod.	Exceeds	Exceeds	Meets	Meets	Meets	Meets
Lancaster Cove	Max. Mod.	Exceeds	Exceeds	Meets	Meets	Meets	Meets
Kitkun Bay	Max. Mod.	Exceeds	Exceeds	Exceeds*	Meets	Meets	Meets
Port Johnson	Max. Mod.	Exceeds	Meets	Meets	Meets	Exceeds	Meets
Moir Sound	Par. Ret./Mod.	Exceeds	Exceeds	Meets*	Meets*	Meets*	Meets*
North Arm	Par. Ret./Mod.	Exceeds	Exceeds	Exceeds*	Meets*	Exceeds*	Meets*
Exceeds	Proposed harvest results in a visual condition that exceeds the proposed VQO for the viewshed, i.e. meets a higher VQO.						
Exceeds*	Though the proposed harvest will meet the VQO in a portion of the viewshed, in the vast majority of the viewshed, the proposed harvest exceeds the VQO.						
Meets	Harvest planned in the viewshed meets the proposed VQO.						
Meets*	Harvest meets proposed VQO assuming mitigation measures are followed.						

Recreation Opportunity Spectrum (ROS)

Implementing any of the action alternatives will change the existing Recreation Opportunity Spectrum (ROS) class within the project area. Figure SUM-7 shows the change in ROS class by alternative.

Figure SUM-7
Changes in ROS Class by Alternative

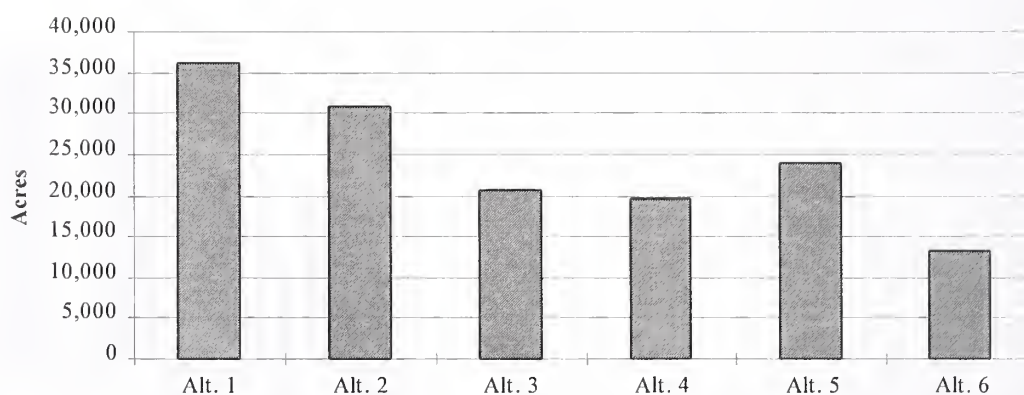


Summary

Roadless Areas

The TLMP RSDEIS (1996a) identified one roadless area which lies within the project area. The impact of timber harvesting on roadless areas is much larger than the acres harvested because the sights and sounds associated with the harvest activity affect the surrounding area. Roadless areas generally need to be at least 5,000 acres in size to be considered roadless. Figure SUM-8 shows the number of roadless acres that will remain after implementation of an alternative.

Figure SUM-8
Roadless Area Acres Remaining by Alternative



Issue 4. Wildlife Habitat

The major effect on wildlife habitats in all action alternatives is the reduction of old-growth forest habitat. Impacts to other habitats were reduced by the interdisciplinary design of units prior to alternative formulation. All alternatives result in impacts consistent with the implementation of the TLMP (1979a, as amended) and the Preferred Alternative, TLMP RSDEIS 1996a, Standards and Guidelines.

Table SUM-11 displays the potential reduction in wildlife habitat capabilities, as estimated by habitat capability models, for the key Management Indicator Species (MIS) found in the Chasina Project Area. This table displays the 1954 long-term habitat capability and estimated short-term reduction in habitat capability after potential implementation of the alternatives.

Table SUM-11
Potential Changes in Habitat Capability Numbers Within the Project Area for MIS in 1998

Species	Habitat Capability		Changes from 1996 by Alternative					
	1954	1996	1	2	3	4	5	6
Sitka black-tailed deer	2,410	2,017	0	-93	-138	-210	-174	-304
black bear	86	77	0	-2	-4	-6	-5	-8
otter	52	52	0	0	0	0	0	-1
marten	97	86	0	-4	-6	-9	-7	-13
hairy woodpecker	900	890	0	-35	-49	-90	-72	-127
Vancouver Canada goose	242	222	0	-6	-12	-18	-14	-25
bald eagle	123	121	0	0	0	0	0	-1
brown creeper	1,983	1,947	0	-71	-92	-193	-165	-272
gray wolf	7	5.8	0	-0.3	-0.4	-0.6	-0.5	-0.9

SOURCE: USDA Forest Service, 1996

Note: Number do not incorporate patch-size effectiveness calculations (see the Old-Growth/Biodiversity section).

Summary

Forest fragmentation represents a change in the overall forest landscape from large, contiguous blocks of old-growth forest to smaller blocks separated by timber harvest units. Increased amounts of forest fragmentation indicate reduced habitat potential for species which are thought to be dependent on interior old-growth forest habitat. One way to analyze forest fragmentation is to measure the reduction of large, contiguous blocks of old-growth forest as a result of timber harvest. Large and medium sized blocks of old growth (Nutkwa LUD II Area and South Prince of Wales Wilderness Area) are adjacent to the project area. In addition, the project area contains a significant amount of old-growth habitat in blocks over 1,000 acres in size. Table SUM-12 displays the number of acres of old-growth habitat in large blocks that will remain after implementation of an alternative.

Table SUM-12
Effect of Timber Harvest on Forest Fragmentation in Acres

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Acres of unfragmented blocks of 101-500 acres remaining after harvest	3,548	3,929	3,442	4,672	3,198	4,759
Acres of unfragmented blocks of 500-1,000 acres remaining after harvest	4,019	2,871	2,834	5,091	5,844	3,858
Acres of unfragmented blocks of >1,000 acres remaining after harvest	14,215	13,647	13,114	8,698	9,925	8,516
Total acres of old growth remaining after harvest	24,006	22,814	22,084	21,101	21,718	19,830

SOURCE: USDA Forest Service 1996

Note: Old growth includes only Volume Class 4 and above.

Late successional corridors approximately one-quarter mile wide (see Figure SUM-3) that provide connectivity between core areas of unfragmented old-growth habitat were identified. These corridors are along the west side of South Arm of Cholmondeley Sound and from Kitkun Bay to Chasina Point. Alternative 6 would impact the corridors to the largest degree, followed by Alternative 5, Alternative 4, and Alternative 3. Alternative 2 would do the best job of maintaining these corridors.

Issue 5. Subsistence Use

Chapter 3 evaluates the potential site-specific effects on subsistence that could result from implementing any of the proposed timber harvest and associated road construction alternatives.

The Tongass Resource Use Cooperative Survey (TRUCS) identified areas which are most heavily used by subsistence households. Based on the TRUCS, the project area contains no

high or moderate use subsistence areas. High and moderate use is interpreted to mean greater than 50 households ever used the area for subsistence deer hunting.

Deer hunting is one aspect of subsistence use affected by timber harvest. The Wildlife and Subsistence sections of Chapter 3 discuss the computer models used to estimate the effects of timber harvest on deer habitat capability—both long range and short range. Based on this analysis, Alternative 1 will cause no reduction of deer habitat capability. Among the action alternatives, Alternative 2 would cause the least reduction to deer habitat capabilities (93 deer), while Alternative 6 would reduce deer habitat capabilities the most severely (304 deer) within the project area.

Table SUM-13 displays the number of deer the habitat in the WAAs (1210, 1211, and 1213) can support after the implementation of an alternative, and after the second growth is in a closed canopy (2040). The full WAA habitat capability has not been reduced for the effects of fragmentation.

Table SUM-13
Deer Harvest and Habitat Capability for WAAs 1210, 1211, and 1213

Alternative	Habitat Capability		Population of Deer Needed to Meet Demand
	1998	2040	1996
1	5,984	5,984	800
2	5,891	5,809	800
3	5,846	5,725	800
4	5,774	5,590	800
5	5,810	5,658	800
6	5,680	5,414	800

SOURCE: USDA Forest Service 1996

Note: Habitat capability for entire WAAs has not been reduced for fragmentation

The project area is located within portions of three Wildlife Analysis Areas (WAA)—1210, 1211, and 1213. The harvest is 80 deer per year based on Alaska Department of Fish and Game (ADF&G) hunter surveys for the complete WAAs. Approximately 800 deer are needed to support this level of deer harvest. Currently (1996) the three full WAAs provide habitat capability for 5,984 deer. The habitat capability through the year 2004 is projected to be at least 5,680 deer.

Competition for subsistence resources in the project area is a scoping issue. Subsistence users from communities on Prince of Wales Island are concerned with competition from residents of

Summary

Ketchikan. Since Ketchikan residents are considered non-rural, this competition can be regulated if it starts to restrict rural residents' ability to obtain subsistence resources. Deer habitat capability in all WAAs is presently adequate to sustain all current and projected harvest now and through the year 2040.

The Federal Subsistence Board may use its authority to regulate non-rural harvest of deer and has authority to prioritize the harvest of deer among rural residents when necessary to protect the resource. The current deer population level does not require restrictions on non-rural users.

There is no evidence to indicate that availability of salmon, finfish, shellfish, or other food resources to subsistence users would be affected by sport or non-rural harvest. Any increase in competition from non-rural Alaskan residents and nonresidents would not be substantial because of the availability of resources in the immediate vicinity and in the surrounding areas.

The above analysis indicates that the actions proposed in all alternatives will not represent a significant possibility of a significant restriction on subsistence use of deer, black bear, or otter in the project area. Wolf harvest in the project WAAs is at the peak of the level that can be sustained. With future reductions of habitat capability for wolf and marten, there may be a significant possibility of a significant restriction of subsistence use of marten and wolf at some point in the future for all alternatives including the No-Action Alternative.

Issue 6. Caves and Karst

All alternatives were designed to maintain the natural karst processes and the productivity of the karst landscape. No harvest units are planned on high karst vulnerability areas. Table SUM-14 displays the acres of harvest on high and medium karst vulnerability areas.

Table SUM-14
Acres of Harvest on High and Medium Karst Vulnerability Areas

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
High Karst Vulnerability	0	0	0	0	0	0
Medium Karst Vulnerability	0	101	158	400	198	413

Issue 7. Social and Economic Effects

The State of Alaska receives 25 percent of the sum of all net receipts from timber sold on National Forest System lands plus any purchaser road credits. This money is earmarked for public school and road maintenance funding. Table SUM-15 shows the estimated returns to the State of Alaska from the harvest of timber (from this project only) by alternative. Actual returns will be based upon sale volumes and appraised rates and may differ from this estimate, which is based on mid-market rates.

Table SUM-15
Estimated Returns to State of Alaska from Sale of Timber

Alternative	Estimated volume (MMBF)*	Total receipts**	Estimated returns to the State
1	0	0	0
2	35	\$2,265,200	\$566,300
3	61	\$7,515,810	\$1,878,953
4	87	\$4,716,270	\$1,179,068
5	69	\$6,352,830	\$1,588,208
6	128	\$12,003,840	\$3,000,960

SOURCE: USDA Forest Service 1996

* Includes right-of-way volume

** Based on mid-market rates timber receipts and purchaser credit for road construction.

Table SUM-16 displays the employment (jobs) and personal income (salaries) associated with each alternative averaged over a four-year period. The jobs and salaries listed include those both directly and indirectly dependent upon the timber industry.

Table SUM-16
Timber Industry Employment and Income by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Total Volume Harvested MMBF	0	35	61	87	69	128
Employment (Jobs)	0	204	344	496	392	732
Personal Income (Millions\$)	0	12.1	20.5	29.5	23.3	43.6

SOURCE: USDA Forest Service 1996

Summary

All Alternatives provide sufficient volume, in combination with other scheduled offerings, to meet short-term contractual obligations to KPC and/or assist the independent timber purchasers in maintaining timber-related employment in the region. In these alternatives, the total volume (including ROW volume) harvested ranges from 35 MMBF in Alternative 2 to 128 MMBF in Alternative 6. Alternatives 3, 4, and 5 provide 61 MMBF, 87 MMBF, and 69 MMBF respectively. These volumes could be provided to KPC in harvest offerings that would meet contract requirements and maintain the volume needed to continue production. They could also be sold to independent timber purchasers.

Under Alternative 1, the no-action alternative, none of the employment described above would be supported by timber harvest activity in the Chasina Project Area. This would result in a negative effect on timber harvest employment should local timber purchasers not be able to substitute volume from another source. The effects of Alternative 1 are not predictable and could range from elimination of shifts to partial or even full shutdown of the local mills for an unspecified period of time. Selection of the no-action alternative could also have potential long-term ramifications to the contract holder, the core communities, and ultimately Southeast Alaska, through de-stabilization of the wood products industry.

The projected long-term effects of different harvest levels are contained in the TLMP RSDEIS (1996a). Timber supply analysis indicates it is unlikely that sufficient timber supply would be available within the Chasina Project Area to sustain the scheduled timber harvest through the end of the first rotation (year 2054) when second growth would become widely available for harvest. However, this conclusion depends on future timber values and whether improved or more efficient logging systems are developed to make economically marginal timber more attractive. It also depends on the status of new land use allocations that would reduce the timber base.

None of the alternatives is expected to have a significant direct impact on the commercial fishing, recreation, and tourism industries or related employment.

Issue 8: Marine Environment

Direct effects to the marine environment are assumed to occur only from development and use of LTFs, and are limited to the intertidal area affected by rock fill and either the intertidal or subtidal areas potentially affected by accumulations of bark debris.

A total of six potential LTF locations were considered for possible development. There are four existing LTF sites and two potential new sites. Three existing LTFs on Kootznoowoo Native Corporation lands (Dora Bay, Divide Head, and Port Johnson) were considered, but not needed for management of National Forest Systems Lands. The maximum number of LTFs that would be utilized under any alternative is three (two new sites and one existing site). The final selection of which LTF sites to utilize was based on the interagency guidelines (Alaska Log Transfer Facility Siting, Construction, Operation, and Monitoring/Reporting Guidelines). The U.S. Fish and Wildlife Service and the National Marine Fisheries Service staff conducted subtidal surveys at the sites that appeared to best meet the interagency guidelines. The subtidal survey reports and recommendations, which are included as part of Appendix E, were used to further define which of the potential LTF locations were preferable. Table SUM-17 displays the LTFs involved in the various alternatives. See also the detailed alternative maps included with Chasina EIS.

Table SUM-17
Log Transfer Facilities Required, by Alternative and System

LTF Name	Alternative						LTF System
	1	2	3	4	5	6	
Lancaster Cove	N	Y	Y	Y	Y	Y	A-Frame
West Arm Cholmondeley*	N	N	Y	N	Y	Y	A-Frame
North Arm Moira*	N	N	Y	N	N	N	A-Frame

SOURCE: USDA Forest Service, 1996

Y = Planned for intermittent use; N = Not planned for use.

* New Log Transfer Facilities.

Table SUM-18 displays the number of LTFs used or developed, the total acreage of the structural embankment, and the estimated acres to be affected by bark deposition. The combination of the marine habitat covered by the structural embankment and the area potentially covered by bark deposition represents the total loss of marine benthic habitat for each alternative.

Table SUM-18
Marine Benthic Habitat Affected by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Number of LTF Sites	1	1	3	1	2	2
Structural Embankment (Acres Affected)	.23	.23	.69	.23	.46	.46
Bark Deposition (Areas Affected)	1.0	1.0	3.0	1.0	2.0	2.0
Total Acres of Marine Benthic Habitat Affected	1.23	1.23	3.69	1.23	2.46	2.46

SOURCE: USDA Forest Service 1996

Alternatives 1, 2, and 4 have no additional effect on the marine environment, while Alternatives 5 and 6 affect the marine system (2.46 acres) in a similar fashion. Alternative 3 would have the greatest impact (3.69 acres). The loss of habitat is much less than one percent

Summary

of the available marine habitat in the project area. Since all species identified along the subtidal (underwater) survey transects are common throughout Southeast Alaska, it is concluded that there would not be a significant impact to the marine environment from constructing (or continuing to use) LTFs at the proposed sites.

Mitigation Measures

TLMP Mitigation

The Forest Service uses numerous mitigation and preventive measures in the planning and mitigation of land management activities. The application of these measures begins during the planning and design phases of a project. They link to the overall Forest, Ketchikan Administrative Area, and Ranger District management direction and continue through all phases of subsequent forest management. The standards, guidelines, and direction contained in the current TLMP (1979a), the TLMP RSDEIS (1996a), Alaska Regional Guide, and applicable Forest Service manuals and handbooks have been applied in the development of alternatives and design of harvest units and roads.

Listed below is a brief summary of some of the mitigation measures common to all alternatives. Specific mitigation measures, as applied to each individual unit, can be seen in the “As Planned” Unit Layout and Road Cards. These unit and road cards are an important tool for implementing the project, as they list standards and guidelines and provide a mechanism for tracking project implementation. Unit and road cards have been developed for each individual unit that occurs in an alternative and appear in Appendix J.

Water Quality and Fish Production

TTRA, BMPs, Water Quality

Mitigation to protect water quality, fish habitat, and wetlands includes application of the Best Management Practices (BMPs) stated in the Soil and Water Conservation Handbook (USDA FSH 2509.22). This handbook provides standard operating procedures for all stream classes. In addition, the TTRA mandates a minimum 100-foot buffer on all Class I streams and on Class II streams that flow directly into Class I streams. The width of this buffer strip may be greater than 100 feet for reasons such as topography, riparian soils, a windfirm boundary, timber stand boundaries, logging system requirements, and varying stream channel locations. In addition, certain Class III streams flow directly into or have been identified as influencing Class I streams. These Class III streams have been buffered to the slope break of the channel or to a windfirm boundary to protect water quality. Split yarding or full suspension was built into the logging and transportation design process, as was partial and full suspension over wetland soils or soils with a higher mass movement potential. Direct in-stream impacts are minimized through road construction timing and fish passage requirements on certain Class I and II streams. Refer to Appendix J (Unit and Road Cards) for the unit-specific stream buffering, suspension, passage, and timing requirements being applied. When pulling culverts and bridges to close roads, stream banks will be restored to their original grade and all disturbed areas will be reseeded with the appropriate grass seed mixture. Application of BMPs and adherence to the TTRA requirements will protect water quality fish habitat and wetlands as well as riparian habitat important to other species such as deer, bear, and furbearers.

While required TTRA buffers will mitigate most temperature sensitivity concerns, there still is concern about providing topographic shading to Class III streams that flow through harvest units. Table SUM-19 lists units that have characteristics (south aspect, lack of immediate downstream forested stream buffers, historical and continued harvest activities, etc.) that may

contribute to the temperature sensitivity of nearby streams. To mitigate this possible effect: (1) all deciduous trees and conifer trees less than 12 inches d.b.h. within 35 feet of Class III streams will remain standing in these units, or (2) a windfirm buffer will be applied, as negotiated by the field biologist and project forester.

Table SUM-19
Units Having Buffers for Temperature Sensitivity

Unit Number	Alternative(s)					
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
678-312			X	X	X	X
678-339						X
679-407				X		X
679-425				X		X
679-437			X	X	X	X

SOURCE: USDA Forest Service 1996

Wildlife

Mitigation measures to protect wildlife habitat are a part of the design of the alternatives, including the location of the harvest units and roads. Harvest units and roads are intentionally located away from important wildlife habitats (to the extent practicable) to reduce the effects on wildlife. Beach and estuary habitats are completely avoided by harvest units, while road incursions are minimized to the extent practicable. Where possible, disturbance of important travel corridors is minimized to allow the undisturbed movement of wildlife.

Other measures considered to mitigate impacts include road closures, grass seeding of road beds, retention of snags where safe to do so, and scheduling of harvest activities which reduce disturbance to bald eagle nesting and rearing activity. Goshawk surveys (vocalizations) have been conducted. If a goshawk or marbled murrelet nest site is located during the layout process it will be protected using the latest standards and guidelines.

Cave/Karst Resources

Harvest unit boundaries will be modified and logging systems will be prescribed that protect cave and karst resources. Any new karst feature discovered during layout will be discussed with the Forest Geologist to assign the appropriate protection measures.

Subsistence

Because most subsistence use involves harvesting fish and game, mitigation measures that protect or enhance fish and game resources will also protect and enhance subsistence activities. By placing units and roads away from beach and estuary fringe habitats, and away from salmon bearing streams, mitigation measures were built into each of the alternatives considered in the EIS.

Summary

Recreation

North Arm Moira, Recreation

Effects of timber harvest on views from anchorages and known recreation sites will be reduced by leaving buffers of timber along the beaches and inland lakes. The proposed visual quality objectives for this plan emphasize the protection of the visual resource as viewed from saltwater, particularly in North Arm of Moira Sound. Protecting these viewsheds will reduce the direct effects on visual quality. Stream riparian buffers will protect fisheries habitat and sport angler's use of Class I and II streams in the project area.

Cultural Resources

Potential effects on cultural resources can be minimized by excluding project activities from most high sensitivity areas (exceptions are LTFs, camps, a small number of units, and access roads to these facilities). Most high sensitivity areas were surveyed in 1995, with the remaining areas being surveyed in 1996, except for exact road locations which cannot be precisely determined until after unit and road layout occurs. Types of mitigation measures include avoidance, protective enclosures, monitoring of harvest activities, restrictions on size or road location, and recovery and documentation of materials.

TES Plants

Choris Bog Orchid (*Platanthera chorisana*) is a designated sensitive species. Two populations of this species were discovered in muskeg openings during botanical surveys of the project area conducted in 1995. Populations were found within the vicinity of harvest Unit 679-363. The primary risk of perturbation to these populations would be through road construction activities. Road locations have been adjusted to avoid direct impacts to known locations of Choris Bog Orchid.

Monitoring

Monitoring activities can be divided into three broad categories: Forest Plan monitoring, routine implementation monitoring, and project-specific effectiveness monitoring. These broad types are discussed in the following sections.

Forest Plan Monitoring

The National Forest Management Act requires that National Forests monitor and evaluate their forest plans (36 CFR 219.11). The significance of this requirement is emphasized by the recent development of a National Monitoring and Evaluation Strategy (Forest Service 1993). The Strategy is designed to focus agency attention and resources on evaluating implementation of forest plans to provide the Forest Service with information necessary to ensure responsive and efficient management of National Forests. Embodied in the National Monitoring and Evaluation Strategy are three principles: (1) evaluation of results will be readily available to the public, agencies, and other groups; (2) monitoring and evaluation will focus on ecosystems and emphasize interrelationships among biotic and abiotic components; and (3) the strategy will be flexible to meet local needs while encompassing forest, regional, and national requirements.

Three levels of monitoring are incorporated into Forest Plan monitoring and evaluation.

Implementation Monitoring is used to determine if goals, objectives, standards and guidelines, and management prescriptions are implemented as detailed in the Forest Plan and project specifications;

Effectiveness Monitoring is used to determine if goals, objectives, standards and guidelines, and management prescriptions, as designed and implemented, are effective in meeting Forest Plan goals and objectives; and

Validation Monitoring is used to determine whether the data, assumptions, and coefficients used in the development of the Plan are correct.

Most monitoring elements involve the mitigation measures described previously. The mitigation measures are part of a process that includes these three types of monitoring to determine if the measure was implemented and is effective or needs revision. The feedback provided by monitoring results can be used to develop improved methods or additional treatments to ensure that the mitigation will be effective in the future.

Mitigation/ Monitoring Feedback Loop

An annual monitoring report is prepared by each Administrative Area of the Tongass and incorporated into one report at the end of each year. This report addresses all monitoring questions contained in the applicable Forest Plan; references all monitoring being conducted on the Area/Forest; assesses progress toward achieving the goals and objectives described in the Forest Plan; and either certifies that the Forest Plan is sufficient to guide management of the Forest over the next year or proposes needed changes and an approach for dealing with those changes.

Forest Plan monitoring is conducted over the entire Forest on a sample basis. Samples may or may not be taken within the Chasina Project Area; however, monitoring results are designed to answer questions regarding the implementation and effectiveness of mitigation within the project area. A total of 36 implementation, effectiveness, and validation monitoring items are identified in the forest-wide monitoring plan described in the TLMP RSDEIS (1996a). All monitoring is subject to funding and personnel limitations imposed upon the Agency.

Routine Implementation Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of harvest units and roads. Specialists used on-the-ground inventories, computer inventories, and aerial photographs to prepare the documents called unit cards for each harvest unit in each of the alternatives. Cards were also prepared for each segment of road. Resource specialists wrote their concerns on the cards and then described how the concerns could be addressed in the design of each unit and road segment. Resource concerns and mitigation measures will be refined further during final layout when specialists will have one more opportunity to revise the unit and road card recommendations. The unit and road card documents will be the basis for determining whether recommendations were implemented for various aspects of the Chasina Project Area.

Routine implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors ensure that the prescriptions contained on the unit and road cards are incorporated into contract documents and then monitor performance relative to contract requirements.

Effectiveness Monitoring

Effectiveness monitoring seeks answers about the effectiveness of design features or mitigation measures in protecting natural resources and their beneficial uses. Monitoring records will be kept by the responsible staff. Project specific monitoring tasks are described in detail in Chapter 2.

Validation Monitoring

Validation monitoring is conducted to show if the assumptions or models used in planning are correct. It is usually carried out at the Regional level in conjunction with research. Validation monitoring may or may not occur within the Chasina Project Area since this type of monitoring is built into a Forest-wide Action Plan.

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Alternative 2



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Alternative 3





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Alternative 6



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